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# The Green Menace: Unraveling Russia's elite discourse on enabling and constraining factors of renewable energy policies

Niels Smeets

*University of Leuven – KU Leuven, Faculty of Social Sciences, LINES, Parkstraat 45 Box 3602, 3000 Leuven, Belgium*

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ABSTRACT

Against the background of a global energy transition, resource-rich Russia embarked on renewable energy policies (REPs). Having set a renewable goal of 4.5% in the electricity mix (2009), Russia's government introduced support schemes on the wholesale (2013) and retail (2015) electricity markets. This raises the question of how Russia's elite explain this rollout of REPs, as a global shift towards renewables may threaten hydrocarbon exports. Common drivers – security of supply and ecological considerations – seem unconvincing given Russia's substantial fossil fuel reserves and limited implementation of international climate change agreements.

Building on a self-compiled database of 395 Russian texts dealing with renewable energy, this article maps Russia's elite discourse through argument comparison between actors, audiences and over time. By doing so it critically assesses resource-geographic, financial, institutional and ecological enabling and constraining factors.

The article concludes that the main elite arguments for REPs are as an attempt to avert the green menace by establishing a Russia-based RE industry. This would ensure that the country catches up with global technological development and allows Russia to remain an important energy power through diversification towards RE exports. Climate change arguments are mainly used abroad in order to demonstrate Russia's efforts in meeting international obligations.

> *"Frankly speaking, in the field of innovative renewable energy technologies, we are lagging behind states that have an education level far below ours. Far below ours !"* (Former president Medvedev, 2014) [1]

## 1. Introduction[1]

Many import-dependent countries, including EU member states and China, have developed renewable energy support schemes during the last two decades ([2]: 402–404). Politicians of these countries often argue in favor of renewable energy policies (REPs) on the basis of security of supply and ecological considerations [3,4]. Expanding indigenous renewable energy sources may not only reduce import dependence [5], but also greenhouse gas (GHG) emissions [6].

In 2009, late adopter Russia joined this global shift towards renewable energy sources (RES) by setting a targeted 4.5% share of electricity production and consumption originating from RES by 2020 [7].[2] In 2013, the Government launched a capacity-based support scheme (CRESS) with regard to solar, wind and small hydro power plants in order to achieve this quantitative goal [8]. In 2015, an additional support scheme in the retail electricity market has been set up [9]. Russia's energy elite, however, face difficulties in framing REPs given Russia's limited energy import dependence [10] and interest-based approach to the Kyoto Protocol, resulting in flawed climate policy implementation [11,12]. The modest goal also reflects the many hurdles REPs face, ranging from inexpensive electricity prices to the vested business interests of the traditional energy sector [13]. This lack of obvious drivers and serious obstacles raises the question of how policy makers of an energy-endowed country as Russia explain why they pursue REPs on electricity markets.[3]

In order to obtain an exhaustive overview of plausible enabling and constraining factors, a self-compiled database of speeches by Russia's

*E-mail address:* niels.smeets@kuleuven.be.

[1] Abbreviations used: REP: Renewable Energy Policy; RES: Renewable Energy Sources; UPS: United Power System; CRESS: Capacity-based Renewable Energy Support Scheme; GHG: greenhouse gas; IEA: International Energy Agency; IRENA: International Renewable Energy Agency; MNRE: Ministry of Natural Resources and Ecology;

[2] As compared to the current share of RES (wind, solar PV, small hydro) being less than one percent.

[3] Although biomass, biogas and wood pellets in particular are significant industries, this research focuses exclusively on Russia's electricity markets. The reason for this choice is the centrality of the first quantitative RE goal that is specifically tied to the electricity markets, and the fact that the two main instruments in promoting RES are located on the wholesale and retail electricity markets. Further reading: Proskurina [101]. The wood pellet business in Russia with the role of North-West Rusian regions: Present trends and future challenges. Renewable and Sustainable Energy Reviews 51, 730–740.

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energy elite has been systematically scrutinized on the basis of an interdisciplinary coding scheme. The social structurationist approach to energy studies [14] offers such an interdisciplinary model by looking into resource-geographic, financial, institutional and ecological enabling and constraining factors of energy policies. A critical discourse analysis (CDA) is applied to this set of documents [15] in order to weigh factors by frequency of appearance and test them on consistency between actors, audiences and over time. A fifth control factor to probe for credibility of a particular argument is the juxtaposition of discourse with actual policy. This comparative approach results not only in identifying factors, but also filters out the most credible ones, *i.e.* frequently articulated arguments that are widely shared amongst elite actors and communicated consistently across different audiences and over time. In doing so, the comparative analysis reveals underlying power structures in favor of politicians and business actors who are able to push their interests thanks to preferential access to policy making.

This comparative methodological design contributes to the theoretical understanding of the conditions under which certain factors are more likely to be articulated. The article further develops the social structurationist approach that looks beyond the state as a unitary actor. Avoiding the trap of overemphasizing the president's role, the CDA looks into a broader set of political and business actors: the most relevant actors in identifying policy explanations depend on the policy field.

Empirically, exploring how Russia's elite justify REPs in a major energy consuming and exporting country contributes to the debate on differing drivers of import-dependent and energy-rich countries [16]. Moreover, identifying explanations of a late adopter sheds light on the time it takes for an energy transition to occur [17]: a major oil, gas and coal exporter that decided to launch REPs in spite of substantial hurdles might be considered a least-likely case of energy transition.

The remainder of the article is structured as follows: the next section delves into the literature on drivers of REPs in energy-endowed countries, followed by an introduction of the social structurationist model that is operationalized into a coding scheme. Section 4 elaborates on the CDA methodology. Section 5 maps Russia's elite discourse along the four structural dimensions, actors involved and audiences addressed, which is followed by a dimension-wise discussion of particular enabling and constraining factors as expressed by Russia's energy elite. The final section draws conclusions on the most credible enabling and constraining factors as expressed by Russia's energy elite, and their policy implications.

## 2. Literature review: enabling and constraining factors of REPs in energy-endowed countries

Much uncertainty remains regarding the enabling and constraining factors in energy-rich countries, including Russia. Some authors assume that factors similar to import-dependent countries, climate change and security of supply, drive Russia's REPs [18,19].

Nevertheless, the literature on energy-endowed countries questions why these countries would want to develop relatively more expensive renewable energy sources[4] [20,21] that may threaten their own oil and gas exports. Moreover, in contrast to countries relying on energy imports, they have fewer incentives to save energy [22,23] and develop indigenous renewable energy resources to decrease import dependence [3,4]. Environmental drivers may also carry less weight in oil-rich countries with vested business interests [24,25], limited institutional compliance with Kyoto [26], and OPEC's interest in obstructing international climate change negotiations [27]. International environmental regimes may, however, alter costs and benefits and create domestic support [28].

The scarce literature on Russia's REPs focuses on the legal breakdown of concrete REPs [29,8,9], the degree of implementation [30],[5] their risk reduction effect on investments [18] and limited impact on electricity prices [31] in order to explain Russia's REPs. Several resource-geographic and financial arguments in favor of REPs have been suggested [32,33], amongst others fuel-saving opportunities to seek financial gains from export markets [34,35]. Nonetheless, the question remains of how Russia's energy elite themselves explain why they would want to develop REPs in the first place. To fill this gap, this article extensively scrutinizes Russia's energy elite's discourse to identify proclaimed resource-geographic, financial, institutional and ecological enabling and constraining factors and their relative weight. This approach reveals differences within the elite, how they tailor their discourse to different audiences and how debates change over time.

## 3. Framing factors within four energy policy dimensions

In order to meaningfully map elite discourse on a wide range of factors enabling and constraining REPs, the social structurationist approach is most appropriate. The manner in which policy actors engage with structural dimensions takes place through cognitive framing. As Aalto ([36]: 15) puts it "*The model is built around the idea that energy policy actors (…) need to make sense of their policy environment in order to create viable policies. To do so they adopt different cognitive frames guiding their policy choices. With the help of these frames they assess the various dimensions of their policy environment: resource geographic, financial, institutional and ecological.*" This social structurationist model bridges the structure-agency debate by allowing actors to possess agency, while at the same time being limited by structural dimensions. This bounded agency concept is translated into the actor's freedom to frame enabling and constraining factors within one of the four dimensions ([14]: 7).

The resource-geographic dimension deals with the material characteristics, as well as the means of production and technology used to extract, develop and transport energy within a particular geographical environment ([14]: 8). The financial dimension comprises "*all financial transactions, incentives and constraints pertaining to energy*"; the institutional dimension ranges from informal norms and 'rules of the game' to formal sectoral interests and decision-making capacity ([14]: 9). Finally, the ecological dimension deals with environmental externalities of energy production, transport and use ([14]: 10).

The selection of this theoretical approach is underpinned by theoretical, empirical and methodological considerations. Theoretically, Aalto's model looks beyond the state as a unitary actor and attributes agency to the range of relevant actors. Moreover, the four structural dimensions facilitate operationalization of the theoretical question of frame selection [37]: identifying the conditions (actor, audience, time) under which Russia's elite select frames to make sense of the resource-geographic, financial, institutional or ecological dimensions. Empirically, the social structurationist approach has been developed to explain Russia's energy policies as a major energy consuming and exporting country, whereas competing analytical operationalizations such as the concept of energy security find their origin in energy-importing states [38].

An additional strength of the model concerns methodology. The energy literature is fragmented along disciplinary lines, and while this specialization has its merits, it risks missing out on relations and dialogue among disciplines. Aalto's model suggests an interdisciplinary approach, integrating material and ideational aspects, between energy engineering (resource-geographic), economics (financial), politics (institutional) and environmental studies (ecological). Especially regarding political discourse that draws upon data from different

[4] Relative to heavily subsidized domestic substitution goods: gas and nuclear electricity generation. This greatly reduces RE competitiveness on Russia's Unified Power System.

[5] Contrary to the referenced article that deals with what has been done through a policy analysis, this article focuses on what has been said on the basis of a discourse analysis.

scientific fields, this social structurationist approach better reflects the multifaceted nature of energy policy. Through the application of this interdisciplinary model, each statement on energy politics may be coded along one of the four dimensions, thereby minimizing selection bias. A disadvantage might be that these broad categories reduce detailed information on how Russia's elite formulate statements. To avoid such information loss, each statement has been coded inductively in *Nvivo*® [39], before being aggregated into the four structural dimensions. This allows for a detailed qualitative assessment of specific enabling and constraining factor argumentations.

## 4. Data selection, description and analysis

In Russia, energy policy makers mainly consist of executive power officials and major energy business actors [40]. In order to gather a wide range of speeches on REPs from these influential policy actors, the search engines of the presidential (kremlin.ru) and governmental (gov.ru) websites, as well as the two most relevant ministries, the Ministry of Energy (minenergo.gov.ru) and the Ministry of Natural Resources and Ecology (mnr.gov.ru), have been used. The result is an exhaustive database of primary Russian language texts from the formative years of Russia's REP development: from 2009 with the launch of the first quantitative RE goal, to Russia's ratification of the Paris agreement, which substantially increased renewable energy efforts in 2016.[6]

This data selection includes business actors, including traditional, renewable and electricity-intensive companies, that have access to the above executive bodies, and may consequently enable or constrain REPs. Nevertheless, focusing on renewable energy documents underestimates the policy influence of traditional energy companies, as statements greenwashing fossil fuels mostly fall beyond the scope of the dataset.[7] Importantly, energy policy documents and laws have not been included to distinguish between framing of policy choices and actual policy. Thus, the database mainly consists of speeches, press-conferences, interviews and transcripts of domestic and international meetings.

This data gathering method resulted in 395 texts between 2009 and 2016[8]: 104 presidential and 131 governmental documents, 119 texts from the Ministry of Energy and 41 from the Ministry of Natural Resources and Ecology.[9]

As concerns the coding procedure, in a first stage every statement relating to REPs was coded inductively during a text-by-text reading. In a second stage, these statements were grouped by argument why Russia should (not) develop REPs. Finally, these grouped arguments were categorized into one of the four structural dimensions (resource-geographic, financial, institutional and ecological) during a third stage.

Additionally, each statement has been coded by the actor (president, minister, energy company,…) and every text makes reference to the exact point in time along the 2009–2016 continuum.[10] To account for the reach of an argument, each document has been coded as mainly addressing either a domestic or a foreign audience.[11] This allows us to discriminate between statements made by different actors and oriented towards diverse audiences to check for quantitative and qualitative discrepancies, as well as trace evolutions over time.

This comparative CDA consists of three steps. First, a quantitative exploration of all relevant statements by dimension, actor, audience and time was executed on the basis of Nvivo®'s matrix coding query. After this quantitative mapping, a second step of qualitative deepening followed to unveil the actual arguments behind the counts and percentages. In some cases a third step, in the form of an additional quantitative analysis, has been performed in an attempt to generalize qualitative findings to the population of texts on renewable energy by Russia's energy elite.

In order to highlight the most credible discursive factors, the weights of each explanation are based on the frequency of appearance of a particular explanation and the actor's rank in Russia's political hierarchy, ranging from the president, over the prime minister, vice-prime minister, ministers and vice-ministers. In addition, consistency over time may further strengthen a factor. Finally, the audience addressed measures the reach of an argument by gauging whether an argument mainly served a domestic or foreign purpose. This way, three conditions must apply to a factor in order to be credible: widely shared amongst elite actors, consistent over time and across different audiences.

## 5. Mapping renewable energy policy factors along the four structural dimensions

The methodology as described in the previous section results in a mapping of enabling and constraining factors of REPs by dimension as framed by Russia's energy elite from 2009 to 2016. Fig. 1 provides information on the relative attention to each dimension, as well as the concrete enabling and constraining factors within each dimension.[12] Thus, most discursive attention has been attributed to the resource-geographic dimension, followed by financial factors and institutional settings, and the least attention was paid to ecological aspects of renewable energy.

The latter finding seems not only to contrast with the attached importance to environmental factors by import-dependent countries [4,41] but also Russia's signature of the Paris agreement [42]. On the basis of frequencies, Russia's elite devote far less attention to ecology than might be expected on the basis of their discourse at international climate change conferences. Was it not Russian representatives who explicitly engaged themselves in Copenhagen [43] and Paris [44] to reduce emissions by raising the share of RES?

[6] Keywords (stems) used within the search engines to select appropriate documents: 'vozobnovlayem*'['renewables']; 'gidro*' [hydro], 'soln*'[solar], 'vetr*' [wind]. Other relevant ministries such as the Ministry of Finance and the Ministry of Industry and Trade have been considered, however too few statements have been found that deal with renewable energy within the time frame. Moreover, rather than complete speech transcripts, they publish narrative press releases with selective quotes or the search results are limited to legal texts.

[7] The selection of texts from these executive institutions cover a wide range of actors, including international organizations and business actors, as the president and ministers often meet with major energy companies and other stakeholders. It is exactly these business actors with access to the executive that have the most influence on policy making. The textbook example is Igor Sechin, CEO of Rosneft who also fulfills the function of secretary of Russia's main energy policy making institution, the Presidential Commission on Strategic Development of the Fuel and Energy Sector and Ecological Safety.

[8] Not all ministries publish exact transcripts of speeches and meetings. Wherever possible, the primary source has been identified and used in the discourse analysis. The author transcribed radio and television interviews to texts whenever the source was exclusively available in audio or video format.

[9] The Nvivo® database which offers a link to each coded statement under these nodes is available upon request.

[10] The date on which the speech was delivered, coded as dd.mm.yyyy.

[11] The following decision tree has been applied consistently to discriminate between internationally and domestically oriented texts: if a text has been generated abroad, it has been categorized as 'internationally oriented', if a text has been produced within Russia, then a text has been coded as 'internationally oriented' when the partner is a foreign country or company, or when the audience consists of international actors. In all other cases, a text is coded as 'domestically oriented'. Therefore, the Saint-Petersburg International Economic Forum is coded as internationally oriented, although participants convene within Russia's borders. A discussion between the president and Gazprom, or an interview of the minister for energy to the Russian newspaper *Kommersant'* are coded as mainly 'domestically oriented'. The international dimension has been subcoded to represent the following regions: Europe, USA, Middle East, CIS, Africa to allow for further refinement in discriminating between Western and non-Western audiences. In Nvivo®, the matrix coding query has been applied to generate the cross-tables between cases (audience type, actor) and nodes (four dimensions).

[12] The more a statement has been coded under a dimension/factor, the larger the size of the rectangle. On the basis of absolute counts, the frequency distribution is as follows: Resource-geographic dimension: 41.2%; Financial dimension: 24.7%; Institutional dimension: 22.2%; Ecological dimension: 11.9%

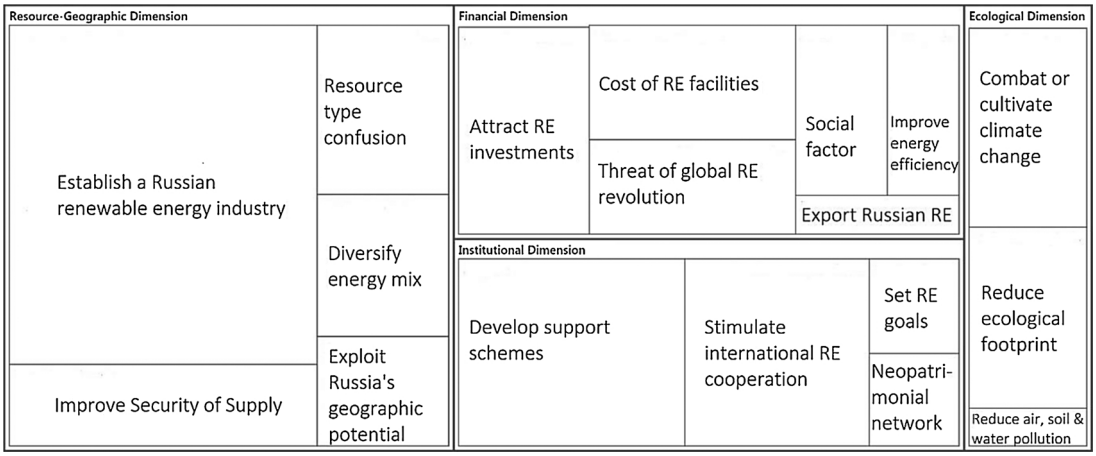


**Fig. 1.** Hierarchy chart of Russia's elite discourse on enabling and constraining factors of renewable energy policies (Absolute number of coding references).
Source: Author's own computations on the basis of a self−compiled database of 395 Russian language texts with the help of Nvivo®'s hierarchy chart, sized by the absolute count of coding references).

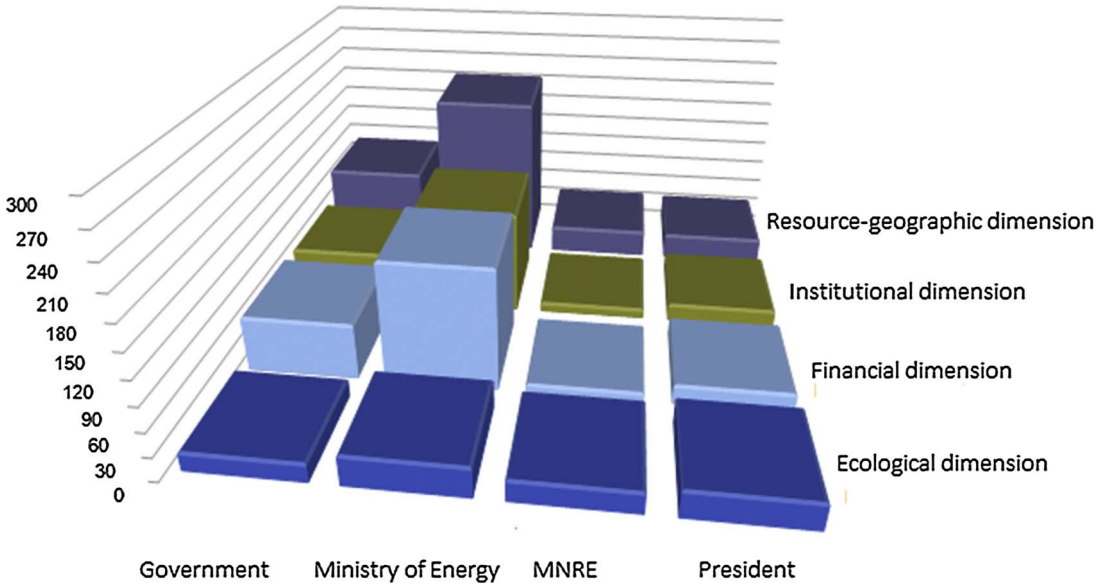


**Fig. 2.** Distribution of structural dimensions by main institutional policy actors (Absolute number of coding references).
Source: Author's own computations on the basis of a self−compiled database of 395 Russian language texts with the help of Nvivo®'s Matrix Coding Query: Node dimensions by institutional actor case.

Past research, however, has demonstrated that Russia has a rather pragmatic interest in climate change negotiations [12] and faces significant constraining factors that impede ecological modernization [25]. Indeed, ecology represents only 0.7% of Russia's state budget expenditures ([45]: 5); the Ministry of Natural Resources is also responsible for ecology; environmental NGOs have been increasingly impeded by law [46][13] and recognize their limited influence on policy making [47]; and the oil and gas lobby is closely linked to Russia's policy makers [13].

In order to gain a better understanding of the distribution among policy makers, Fig. 2 breaks down the dimensions by main institutional actors.[14] This actor distribution first and foremost provides insight into the importance of REP as a policy field. Within the research time frame 2009–2016, the Ministry of Energy most often makes reference to REP, followed by the Government, while the frequencies of the president and the MNRE fall behind. This supports the argument that depending on policy area, other actors than the president may be more relevant for study. Looking beyond the presidential discourse may be appropriate in less politicized fields such as renewable energy.

Secondly, Table 1 provides insight into the relative discursive attention each actor pays to the four structural dimensions. Resource-geographic explanations dominate in almost all actors' speeches, while ecological drivers find far less resonance at the governmental level and the Ministry of Energy. Surprisingly, the president pays proportionally

[13] For example NGO 'Eko Defense', which supported the rollout of RES, had to close down its activities because it has been registered as a foreign agent.

[14] Institutional actors cover the following actors (Time frame of documents covered between brackets): President: D. A. Medvedev (2009–2012), V.V. Putin (2012–2016), A.I. Bedritsky (2010–2016); Government: V.V. Putin (2009–2012), D.A. Medvedev (2012–2016), deputy prime ministers V.A. Zubkov (2009–2012), A.V. Dvorkovich (2012–2016); Ministry of Energy: S.I. Shmatko (2009–2012), A.V. Novak (2012–2016), (first) deputy ministers of energy A.Y. Inyutsyn (2012–2016), A.L. Teksler (2013–2016); MNRE: Y.P. Trutnev (2009–2012), S.Y. Donskoy (2012–2016).

**Table 1**
Distribution of structural dimensions by main institutional policy actors (Absolute number of coding references and column percentages).
Source: Author's own computations on the basis of a self-compiled database of 395 Russian language texts with the help of Nvivo®'s Matrix Coding Query: Node dimensions by institutional actor Case.

| | Government | Ministry of Energy | MNRE | President |
|---|---|---|---|---|
| Resource-Geographic | 106 (40.8%) | 212 (39.9%) | 35 (41.6%) | 33 (29.5%) |
| Financial | 70 (26.9%) | 152 (28.6%) | 10 (11.9%) | 25 (22.3%) |
| Institutional | 60 (23.1%) | 129 (24.3%) | 12 (14.3%) | 19 (17%) |
| Ecological | 24 (9%) | 38 (7,1%) | 27 (32.1%) | 35 (31.25%) |
| Total | 260 | 531 | 84 | 112 |

renewable energy development (Table 2).

Within the resource-geographic dimension, most attention is paid to establishing a Russian renewable energy industry.[15] This can be broken down into four subnodes: construction of renewable power plants; localization of manufacturing facilities of RE components (solar panels, wind and hydroelectric turbines); development of R&D institutes; and modernization of transmission grid infrastructure.[16]

Policy makers agree that Russia lags behind in terms of renewable technology development, even when compared to their BRICS partners [1]. In order to reduce dependence on foreign technologies, REPs should stimulate R&D on Russian soil. These hi-tech innovations must be commercialized to Russian renewable component factories.[17] As energy minister Novak argued, "*Our main task [in the field of RES] is to localize the industry in Russia for the production of solar, wind and small hydro equipment* [48]." In order to offer stable demand for RE components, the Capacity-based Renewable Energy Support Scheme (CRESS) in Russia's wholesale market guarantees a 12–14% return on investment for the (timely) commissioning of solar, wind and small hydro power plants that are at least partially manufactured in Russia [49].

**Table 2**
Enabling and constraining factors by audience (Absolute number of coding references).
Source: Author's own computations on the basis of a self-compiled database of 395 Russian language texts with the help of Nvivo®'s Matrix Coding Query: Node factors by audience addressed Case.

| Dimension | Enabling and constraining factors | Number of references | Domestic audience | Foreign audience |
|---|---|---|---|---|
| **Resource-geographic dimension** | Establishment of national RE sector | 278 | 208 | 70 |
| | Improve security of supply | 72 | 60 | 12 |
| | Resource types other than RES | 65 | 56 | 9 |
| | Diversification of energy mix | 56 | 39 | 17 |
| | Geographic potential | 44 | 29 | 15 |
| | **Dimension Total** | **515** | **392** | **123** |
| **Financial dimension** | Attract RE investments | 85 | 46 | 39 |
| | Cost of RE technologies | 72 | 67 | 5 |
| | Threat of global RE development | 64 | 44 | 20 |
| | Socio-economic implications of REP | 50 | 46 | 4 |
| | Energy Efficiency | 40 | 30 | 10 |
| | RE exports | 21 | 11 | 10 |
| | **Dimension Total** | **332** | **244** | **88** |
| **Institutional dimension** | Support Schemes | 123 | 106 | 17 |
| | International RES cooperation | 108 | 18 | 90 |
| | Goal Setting | 28 | 21 | 7 |
| | Neopatrimonial networks | 25 | 22 | 3 |
| | **Dimension Total** | **284** | **167** | **117** |
| **Ecological dimension** | Climate Change | 77 | 25 | 52 |
| | Reduce ecological footprint | 67 | 44 | 23 |
| | Reduce air, soil, water pollution | 15 | 8 | 7 |
| | **Dimension Total** | **159** | **77** | **82** |

most attention to ecological factors (31.25%). This may be due to his internationally-oriented position, compared to the domestically-oriented Ministry of Energy's focus on resource-geographic and financial factors.

To critically assess the identified enabling and constraining factors, Table 2 displays an overview of factors by audience addressed. At the level of dimensions, it is clear that the majority of statements are made in front of domestic audiences, with the exception of the ecological dimension. At the level of factors, climate change and international cooperation initiatives are the only factors that are predominantly discussed in front of foreign audiences. On the basis of this quantitative data, we may preliminary conclude that the highlighted factors are mainly aimed at convincing a domestic audience why Russia should develop REPs.

In what follows, the most often mentioned enabling and constraining factors will be qualitatively analyzed in order of overall dimensional attention (Fig. 1).

### 5.1. Resource-geographic factors

Out of the four dimensions, resource-geographic factors received most attention (Fig. 1) and are widely shared among the most important policy actors (Table 1). Moreover, these arguments are mainly used to convince domestic audiences why Russia seeks to invest in

Such renewable energy plants are also seen as a means to improve security of supply and diversify the electricity mix. However, these enabling factors, seemingly recognizable from consuming countries, must be contextualized. In Russia, security of supply is not so much related to international import dependence as interregional [50]. The statements frame local renewable energy development as a means to reduce interregional electricity and fuel transport towards energy-deficient subjects of the Russian Federation, rather than investing in (the maintenance of) long distance high-voltage power lines that are sensitive to transmission losses and disruptions. Moreover, renewable energy

[15] 'Renewable energy industry' in the article refers to the entire production chain, consisting of the manufacturing of turbine components and solar panels, as well as developers of solar, wind and hydro power plants and Russian renewable R&D companies.

[16] As to facilitate the integration of intermittent renewable energy plants

[17] The modernization of Hevel's solar panel manufacturing plant in Novocheboksarsk is the textbook example for this translation of Russian R&D to manufacturing. The solar panel facility uses thin-film technology developed within the Physical Technical Institute, Saint-Petersburg, to upgrade its production process.

generation should be preferably developed first in Russia's isolated regions as a solution to expensive and polluting local diesel generation and recurrent blackouts [51,52]. Energy minister Novak [53] mentioned the case of Crimea's electricity deficit after the peninsula had been cut off from the Ukrainian power grid as an example of how locally available solar and wind capacity could help meet electricity demand in so-called 'energy islands'.

The diversification strategy, on the other hand, does not so much aim to reduce import dependence from fossil fuels, but rather reduce the dominance of natural gas in Russia's electricity mix [54].[18] In particular, the goal consists of fostering non-fuel energy sources, including RES, to lower dependence on finite fuels. However, the Energy Strategy until 2030 also aims at increasing coal generation [7].

The main resource-geographic constraining factors remain the confusing framings of energy sources and Russia's geographic potential. Some actors continue to refer to large hydro power as sharing the same ecological characteristics as other, 'more expensive,' renewables [55] although this technology has substantial environmental impacts [56]. Dmitry Medvedev considers nuclear energy to be a renewable source, even though uranium ore is a finite resource: "*the use of peaceful nuclear energy has opened up new possibilities for the development of renewable energy* [57]." Putin highlighted hydrogen as the priority renewable energy source,[19] since solar would not be effective in a "northern country" [58]. This not only shows the limited understanding of what renewable sources are, but also emphasizes the common believe that Russia would have poor technical solar potential [59], thereby overlooking Russia's solar-rich southern regions [60] and substantial overall renewable energy potential [61].

### 5.2. Financial factors

Second to resource-economic factors, financial factors receive most attention, mainly from the Ministry of Energy and governmental actors (Table 1). Aside from the internationally oriented goal to export renewable technologies and attract FDI to the RE sector, financial factors are principally discussed in a domestic context (Table 2).

Financial drivers such as potential energy efficiency gains, RE exports and attraction of new investments have been univocally identified as enabling factors of REP. RE exports only recently gained prominence, with 11 out of 21 references articulated in 2016. Diversifying energy exports towards RES is one of the guarantees to remain a competitive energy power [62]. Importantly, exports mainly concern RE technologies and components, rather than renewable electricity [63].[20] In line with the initial ambition of Russia's vertically integrated solar company '*Hevel Group*'[21] to conquer the European market [64], the Energy Ministry claims that the Novocheboksarsk manufacturing plant supplies internationally competitive solar panels with regard to cell efficiency [65]. This would ensure stable energy rents in a global energy transition context.

Given Russia's high energy-intensity [66], the contribution of renewables to energy efficiency is highly valued by all actors, especially in monetary terms. Medvedev made a case in favor of renewable energy sources, as "*we lose money on [wasting] energy*" [67]. The resulting energy savings may reserve resources for lucrative exports [34,35].

On the other hand, there is much debate of the costs, their socio-economic impact and the threat of global renewable energy development vis-à-vis Russia's traditional energy exports. Whether the cost of renewable energy sources is a driver or hurdle has been subject to fierce debate. 23 of the 72 statements dealing with RE costs (see Table 2) claim that renewable energy technologies are overly expensive given Russia's relatively low-priced gas and nuclear electricity generation. Energy minister Novak even asserts that renewables cannot survive without state subsidies in any country as these technologies are more expensive than their fossil fuel counterparts [68].[22] Moreover, after the ruble crisis at the end of 2014, RES became even more expensive as capex limits have been pegged to a euro/dollar basket, provoking protest from major electricity-consuming companies that have to bear the costs [69].[23]

Another group of 49 statements make reference to the steeply declining costs of green technologies, and identify conditions under which renewables could be developed in Russia. 25 out of these 49 statements underline that renewables may reduce transmission and fuel costs thanks to local availability, minimization of transmission losses and low operating costs. In Russia, however, this would only be economically viable in isolated areas with long and expensive transportation routes and costly diesel oil [19].[24]

Related to this cost price debate are the expected socio-economic implications of REP. As Novak warned, "*According to the current system of tariff formation, additional subsidies for the development of renewable energy sources lead to an increase in prices for end users, requiring a delicate approach in setting the volume and growth rate of renewable energy sources* [70]." Dvorkovich [71] strengthens this discourse by associating Germany's leading European renewable energy position with the support of 25 billion euro of subsidies that increased electricity prices to the highest in Europe.

This scaremongering is used to explain to a domestic audience why Russia should not go too fast in developing renewables: "*Russia in this sense has taken a different path [in comparison with Germany], as a hydrocarbon producer (…) we are advancing very gradually, we do not want consumers to pay a very high price for renewable sources* [71]." Russia's CRESS in contrast restrains price increases by setting annual capacity limits (MW) that may receive preferential investment guarantees. Such absolute boundaries cap consumer contributions and raises their predictability, but limit investments to a fixed annual capacity [30].[25] This difference between energy consuming and producing countries positively frames a constraining factor on REP[26]: Russia is able to go slow with an energy transition towards renewables thanks to its enormous gas reserves that can be provided at low cost to its population.

Another polarized debate centers around whether or not global renewable energy development endangers Russia's fossil fuel exports and associated rents. On the one hand, 27 out of the 64 statements (Table 2)

[18] According to the Ministry of Energy, in 2016, 58.6% of electricity was generated by thermal power plants, mainly using natural gas as a resource.

[19] Hydrogen is not a renewable energy resource *an sich*, yet a potential carrier, a renewable fuel, on the condition that the electricity used to produce hydrogen originates from renewable sources such as wind or solar power plants. Personal communication with Dr. Jan Rongé, PEC cell research, KU Leuven, 30.03.2017. See also Singh et al. [102]. Hydrogen: A sustainable fuel for future of the transport sector. Renewable and Sustainable Energy Reviews 51, 623–633.

[20] The RUSTEC proposal to export wind-generated electricity from Russia's North-Western coast towards the EU via the existing interconnections is geopolitically sensitive, as it may create additional import dependence.

[21] Hevel Group is a joint venture between state company JSC Rosnano and oligarch-led Renova group, comprising a solar panel manufacturing plant in Novocheboksarsk, a solar power plant developer (subsidiary Avelar Solar Technology), and a Science and Technology Center in St. Petersburg. Through its CEO Anatoly Chubais, the concern has direct access to the highest echelons of power, including president Vladimir Putin.

[22] This statement ignores the substantial state subsidies to the fossil fuel sector that by far surpasses renewable energy subsidies.

[23] A. Mordashov is the chairman of the board of directors of energy-intensive steel company Severstal'. These and other electricity-intensive companies pay the bill for the CRESS, as the support scheme relies on consumer contributions to guarantee the 12% return on investments on renewable energy projects that won the open tender.

[24] Within remote regions, renewable energy solutions are cost effective, as they reduce operational costs of diesel installations, whereas in Russia's centralized electricity market, less expensive gas and nuclear generation outcompete renewable power plants.

[25] For instance, in 2017, a maximum of 250 MW of solar power plants may receive investment guarantees under the CRESS tender. These guarantees entail a return on investment guarantee of minimum 12% during 15 years.

[26] As it constrains a swift transition to renewables. A gradual increase of RES within the electricity mix might also entail some advantages, such as grid modernization, and learning opportunities from countries that already developed balancing mechanisms. Nevertheless, inexpensive gas-based electricity generation is used as an argument of curbing ambitions. Hence the evaluation as a constraining factor.

suggest that renewables do not currently pose a threat given their relatively high upfront investment costs and inability to provide baseload electricity due to their intermittent nature. Following this logic, they emphasize that renewables are reliant on backup power from natural gas to ensure stable electricity supplies. Gazprom's CEO Alexei Miller, for instance, argues that although Germany is the leading European renewable energy investor, it is also the largest importer of Russian gas, continues to raise its gas imports and supports new gas pipelines such as Nord Stream I and II [72]. The Ministry of Energy adds that if global fossil fuel prices remain low, it will curb investments in switching to RES and keeps oil as the main transport fuel [73]. Although this group of statements shows the expectation that oil and natural gas will remain the main energy sources, and demand will not decline in the coming 20 years, most do take into account the fact that the share of renewables in the global energy mix will sharply rise. These optimistic statements conclude that by 2035 Russia will be ready to adapt to this change, as outlined in its Energy Strategy [74] and economic forecasts [73].

On the other hand, 37 statements explicitly recognize that renewables will reduce demand for Russian fossil fuels. Igor Sechin [75], CEO of Rosneft, explained to Vladimir Putin that natural gas exports to the EU have been declining, partly due to 'immoderate' subsidies of renewables. Minister for Energy Novak [76] underlines that Russia's energy exports not only face increased competition from energy efficiency measures and renewable energy investments in Europe, but also in prospective Asian markets. Russia's Energy Strategy provides for increased oil, gas and coal exports to Asia, and especially China [7]. China's brisk development of renewable energy plants first and foremost affects Russia's coal industry. As Deputy Minister for Energy Yanovsky [77] remarked, "*the world's leading coal consumer, China, (…) reduced its coal imports by 31%*". Novak [78] notices how another BRICS partner, Brazil, reduces oil demand in the transport sector as the country expands its biofuel production. The most important risk to demand for crude oil may be the development of electric cars; however, Novak [68] tempers this threat by saying that electric cars only represent 1% of the current car stock that will gradually rise to 8–10% by 2035.

Thus, although statements range from direct challenges to coal and gas exports to downplaying short-term impacts, there seems to be agreement that Russia does not have to rush into renewable development, as the green menace will only become relevant within two decades. Nevertheless, Russia has to develop its own RE industry in the medium term if it wishes to insulate itself from future displacement of hydrocarbons by renewable energy sources through diversification of the economy.

### 5.3. Institutional factors

The institutional dimension, dealing with domestic and international RE regulation, comes third in terms of discursive attention (Fig. 1). The main actors emphasizing institutional factors are located within the Ministry of Energy and the Government (Table 1). Except for international cooperation, institutional factors are predominantly domestically oriented (Table 2).

Most attention within this body of statements is attributed to support schemes that attempt to raise the share of renewables in the energy mix. Apart from the premium scheme (*nadbavka*), which has never been implemented [79], the two key policy instruments discussed are the CRESS in Russia's wholesale market [49] and the retail market support scheme [80]. Whereas the CRESS is limited to installations larger than 5 MW and only applies to solar, wind and small hydro investments connected to the Unified Power System (UPS), the retail scheme also encompasses micro and small renewable installations (below 5 MW), including biomass and biogas sources for electric power generation, and may apply to Russia's tariff zones and isolated areas.

In terms of both planned capacity expansion (5.871 GW) and policy implementation, the CRESS is the most encompassing institutional enabling factor [30]. This priority of stimulating large power plants on the oversupplied wholesale market, however, seems to partially contradict the financial arguments in favor of renewable energy exploitation in isolated areas on the basis of cost avoidance.

**Table 3**
Renewable energy cooperation between Russia and its partners (Absolute number of coding references).
Source: Author's own computations on the basis of a self-compiled database of 395 Russian language texts between January 2009 and December 2016 with the help of Nvivo®.

| | Number of references to RE | Of which prior to February 2014 | Of which after February 2014 |
|---|---|---|---|
| EU Member States | 54 | 43 | 11 |
| China | 16 | 3 | 13 |
| Japan | 4 | | |
| South Korea | 4 | | |
| India | 3 | | |
| USA | 3 | | |
| Saudi Arabia | 2 | | |
| IRENA | 19 | | |
| BRICS | 4 | | |
| ASEAN | 4 | | |
| UN | 4 | | |
| IEA | 3 | | |
| APEC | 2 | | |
| CIS | 2 | | |

One of the guiding principles of both support schemes is the local content requirement (LCR). This institutional rule provides that renewable energy components should be, to varying extents [81,80],[27] produced and/or assembled within the Russian Federation if they seek to ensure a guaranteed return on investment [49]. This institutional condition further highlights the resource-geographic argument to establish a Russian RE industry along with hi-tech jobs and demand for technologic research. As Energy Minister Novak [82] explains: "*It is very important that Russian technologies are used, and that the production of necessary components and equipment for the construction of solar and wind power stations is created.*"

In parallel to these domestic enabling regulations, the database also contains joint statements of international cooperation in the field of RE. Having set the first quantitative renewable energy target at 4.5%, Russia's energy elite started looking for expertise and foreign direct investments in order to enable the RE sector. Means of cooperation range from bilateral contacts to multilateral settings. Within the first category of bilateral cooperation mechanisms, EU member states are overrepresented, with China the most frequently mentioned Asian partner (Table 3). Most bilateral agreements seek institutional cooperation to attract RE investments within the Russian Federation and to gain access to know-how in advanced renewable energy technologies of partners such as Germany, France, UK, the Netherlands, Italy and Spain.[28] In these documents, Russia's elite mainly refer to mainstream financial and ecological explanations of improving energy efficiency and reducing GHG emissions. In its relations with China, Russia has developed a strategic cooperation on an equal footing in the field of energy, including to increase investments in renewables and facilitate knowledge sharing [83].

An institutionalization of bilateral relationships between Russia on the one hand, and EU member states and China on the other, is subject

[27] For solar energy, from 2016 onwards, 70% of the components should be produced in Russia to comply with the CRESS' local content requirement. In the case of wind, this should amount to 65% by the same year. Small hydro should only reach 45% of localization, yet starting from 2018, 65% of small hydro should also be localized.

[28] This overrepresentation of large Western European partners does not seem a coincidence, as these are Russia's main energy partners, and renewable energy cooperation is often mentioned as one of the domains within Russian-European energy cooperation.

to a time effect. Out of 16 references to Chinese cooperation, 13 were made after February 2014; while 11 out of the 54 references to relations with EU member states date after this critical juncture (Table 3). This seems to reflect the overall degradation of relations between the EU and Russia in the wake of the Ukraine crisis, and Russia's policy of tightening relations with China. In particular, the Roadmap for EU-Russia Energy Cooperation until 2050, which provided for the objective of '*promoting investments in clean and flexible power generation on the base of clear and stable rules*' [84], became a dead letter after the annexation of Crimea. With China, relations expanded to the establishment of a working group on RES as part of the Russian-Chinese Intergovernmental Commission [85]. In its discourse with China, Russia's energy elite also mention politically sensitive issues such as Chinese interest in Crimea's renewable energy installations in the wake of the peninsula's annexation [86]. This politicization of renewable energy cooperation may further hamper REP development, at least with the West.

Within multilateral arrangements, the International Renewable Energy Agency (IRENA) has been mentioned most often as an enabling factor. Given that it is one of the main international institutions in the field of RE, this would not be surprising, except that Russia only became a member by 22 July 2015. Apart from the advantage of participating in the development of international standards, first Deputy Minister for Energy Teksler highlights resource-geographic factors for establishing an RE sector and avoiding technological backwardness:

> "For us, it is crucial to obtain the necessary data from our colleagues in modern technologies for the subsequent establishment of Russian-made equipment and components, as well as to adopt best practices of management in this area."
>
> [87]

The setting of quantitative renewable energy targets[29] may be considered one of the most important institutional enabling factors of increasing RE investments, yet stability of such goals is an important precondition to investor decisions [88]. A three-step discursive shift over time has been identified, downscaling RE ambitions due to institutional and financial difficulties.

In the run-up to the Copenhagen conference, Russia's government decided to include a 4.5% renewable target in production and consumption of electricity generation within its energy strategy for the first time, and determined intermediate goals of 1.5% by 2010 and 2.5% by 2015 [89].

In 2013, however, the slow operationalization of targets into concrete support schemes demonstrated that the 2.5% intermediate target would not be reached by 2015,[30] as the share of RES at that time remained below 1% of Russia's energy balance [70]. The goal has been *de facto* reduced to 2.5% by 2020 [90] and subsequent documents began referring to this less ambitious target ([91]: 16).

A second implicit shift took place by stating that 5.9 GW of new renewable energy capacity represents 2.5% of installed capacity in 2020 [92].[31] *De facto*, this shift from electricity generation to installed capacity implies a reduction in the quantitative target as installed (peak) capacity of renewable energy (MWp), due to its intermittency, exceeds actual electricity generated (MWh) on the basis of these assets.[32] This is confirmed by the Ministry of Energy forecast that by 2022, a mere 0.3% of electricity generation will originate from renewables ([93]: 73).

A third shift occurred on 28th July 2015, when the time horizon to achieve the RES target had been postponed from 2020 to 2024 for wind projects [94] as the LCR was excessively stringent,[33] and financial conditions deteriorated in 2014.[34] The extended time horizon for wind has direct implications for achieving the 5.871 GW goal, as wind is responsible for the largest share of new planned capacity.[35] This race to the bottom may have turned the goal setting into a constraining factor, inducing investor uncertainty.

On the informal side of the institutional spectrum, Putin [95] and Medvedev [96] multiple times made a case for the state to pull out of major businesses and create a feeding ground for private companies. In particular, Dvorkovich [97] expressed the hope that an open RE tender (CRESS) would instigate competition and entry of new RE companies. Although this pronounced liberalization may stimulate RE investments, in reality it is neopatrimonial networks, which blur the boundaries between public and private domains [98], that have been strengthened through the renewable energy business. By means of state-owned and oligarch-led companies, the state extended its control over the economy to the emerging renewable energy sector as if it were its patrimonium. State-owned Rosnano and oligarch-led Renova became the principal investors in Russia's solar industry, wind farms are being developed by state-owned nuclear energy giant, Rosatom and state company Rushydro won most of small hydro projects within the five CRESS tenders [99]. Although this neopatrimonialisation may lead to clashing traditional and renewable energy interests, renewable energy companies also increasingly gain access to policy makers as state-owned companies are better represented in political institutions. Similar to the climate change regime [28], the growing global consensus on RES surprisingly created support for REPs by some traditional energy companies.

### 5.4. Ecological factors

Fig. 1 demonstrated that policy actors in general pay the least attention to ecological factors in explaining Russia's REP. Relatively, most attention comes from the president and the profile ministry for ecology (MNRE) (Table 1). In terms of specific factors, a discrepancy between audiences exists: whereas general assessments of reducing the ecological footprint through RES are mostly discussed in front of domestic audiences, REP in light of combating climate change is predominantly externally oriented (Table 2).

At first sight, ecological factors seem to be similar to internationally accepted drivers, addressing air, soil and water pollution, tackling climate change and preserving biodiversity. However, rearranging the statements on ecological enabling and constraining factors of REP unveils a polarized discussion with regard to their ecological added value. Table 4 suggest that although most references consider RES as part of the solution to ecological problems almost a quarter of expressions explicitly questions their ecological advantages.[36] These statements range from promoting natural gas and nuclear technologies, to mitigating environmental threats and outright criticism of renewables as environment-friendly resources.

Apart from the absolute counts, the authority of the actor may also influence the weight a statement receives ([11]: 52). To better incorporate the political clout of an actor, the enabling and constraining

[29] Subnode "Set RE goals" in Fig. 1.

[30] The first support scheme, the CRESS, had only been introduced in 2013, four years after setting the 4.5% target.

[31] This coincides with, and refers to the initial goal of the CRESS to implement 5.871 GW of new solar, wind and small hydro capacity by 2020.

[32] In contrast to non-intermittent fossil fuels, for which the installed capacity approximates generation.

[33] As no wind component factories had been localized by 2017, developers found it impossible to construct wind power plants without incurring serious financial penalties for non-compliance with the LCR.

[34] In particular, the devaluation of the ruble at the end of 2014 increased prices of imported RE components reduced the return on investment well under the guaranteed 12% by the CRESS, and the Central Bank's decision to increase the interest rate to 17% further impeded the financing of RE projects.

[35] 3.6 GW of the planned 5.871 GW should come from wind capacity by 2020, versus 1.52 GW of solar and 0.751 GW of small hydro capacity.

[36] These expressions are only the tip of the iceberg, as the database only deals with texts that explicitly refer to renewable energy. One might expect that critical assessments of RES are much more widespread when taking into account texts exclusively dealing with nuclear energy, natural gas, oil, and coal resources.

**Table 4**
Ecological characteristics of renewables as enabling or constraining REP (Absolute number of coding references and column percentages).
Source: Author's own computations on the basis of a self-compiled database of 395 Russian language texts with the help of Nvivo®'s Matrix Coding Query: Nodes of dummy variable consisting of enabling and constraining arguments within the ecological dimension by ecological Dimension.

| Ecological dimension | Sources | Coding references | Percentage of references |
|---|---|---|---|
| Enabling factor | 102 | 118 | 76.6% |
| Constraining factor | 29 | 36 | 23.4% |

**Table 5**
Assessments of ecological characteristics of renewable energy by actor (Absolute number of coding references).
Source: Author's own computations on the basis of a self-compiled database of 395 Russian language texts with the help of Nvivo®'s Matrix Coding Query: Nodes of dummy variable consisting of enabling and constraining arguments within the ecological dimension by actor Case.

| | Constraining factors | Enabling factors | Difference score (E-C) |
|---|---|---|---|
| Putin | 15 | 10 | −5 |
| Medvedev | 7 | 15 | +8 |
| Novak & Shmatko & Teksler (Minenergy) | 7 | 19 | +12 |
| Donskoy & Trutnev (MNRE) | 4 | 12 | +8 |
| Renewable energy companies | 0 | 3 | +3 |
| Traditional energy companies | 1 | 2 | +2[37] |

assessments within the ecological dimension have been plotted by policy actor (Table 5). The three hierarchal levels are clearly reflected in the overall difference score. The deeper down the executive's hierarchy, the less often ecological factors are framed as constraining REP, with the Ministry of Energy being the least negative. Putin expressed more than double the negative assessments than Medvedev. For instance, Putin [100] openly criticized the ecological characteristics of wind energy since windmills kill millions of birds every year and that "There is such *vibration that worms come out of the ground, not to mention moles. This is a real environmental problem.*" Because of this finding that more important politicians voice critical assessments, we must be careful in interpreting the quantitative result that positive assessments outrank negative ones.

In order to critically assess the credibility of ecological factors in driving REP, these statements have been sorted according to audience addressed. Table 2 revealed that the argument combating climate change through REP is mostly used abroad, and in particular to Western audiences (47 out of 52 references), while at home, more general environmental advantages (reducing the ecological footprint) are articulated. Similarly, 30 out of 62 documents mentioning climate change come from 2009 and 2015 and directly refer to COP15 and COP21, whereas the other half of the documents are spread over the remaining six years of the research period. The finding that climate change discourse seems to be tailored to Western audiences might further question whether Russia's elite genuinely seek to combat climate change by raising the share of RES [11]. An alternative explanation would be that it is rather a discursive strategy to convince the international community of Russia's green intentions.

The credibility of climate change arguments in explaining Russia's REP can be further analyzed by dividing climate change statements into positive and negative assessments of RES (Table 6). There is a similar proportion of positive and negative assessments within domestic and Western-oriented debates. However, a qualitative analysis may shed light on the differing reasons why RES may (not) contribute to combating climate change. Within domestic debates, positive assessments of RES in combating climate change are often linked to meeting international obligations (5 out of 17 statements), creating the impression that the climate issue is exogenously driven. The negative assessments reflect Russia's economic interests in exporting traditional energy sources. Russia's coal resources are praised for their low sulfur concentrations providing an ecological advantage over other coal exporting countries [78]. Moreover, natural gas as the cleanest fossil fuel (5 statements), nuclear energy without direct carbon emissions (3), and Russia's vast forests as global carbon sinks (3) are most often named as alternatives to RES in combating climate change. Importantly, such messages downplaying renewables and greenwashing fossil fuels are in line with statements of major oligarchs such as Sechin (Rosneft) and Miller (Gazprom), reflecting business interests of the traditional energy companies. As Sechin conveyed to Putin, "*gas is the best natural ecological and economic choice for Europe*" and the decline of pipeline gas exports to Europe is due to, amongst others, subsidies to RES and carbon emission reduction schemes [75]. In contrast, renewable energy companies unanimously emphasized environmental advantages of their products (Table 5). However, given that these companies currently are far less entangled within Russia's policy making institutions than traditional energy companies (cfr. 5.3), their voice is less heard [24].

**Table 6**
Combat climate change by assessment over audience addressed (Absolute number of coding references and column percentages).
Source: Author's own computations on the basis of a self-compiled database of 395 Russian language texts with the help of Nvivo®'s Matrix Coding Query: Nodes of dummy variable consisting of enabling and constraining arguments within the combat climate change factor by audience addressed Case.

| Audience | Domestic | Western | non-Western |
|---|---|---|---|
| RES may combat CC | 17 (68%) | 30 (64%) | 3 (60%) |
| RES may not combat CC | 8 (32%) | 17 (36%) | 2 (40%) |
| Total | 25 | 47 | 5 |

## 6. Conclusion and policy implications

Mapping the four dimensions by actor, audience and over time provided insights into the most frequently articulated enabling and constraining factors, widely shared by elite actors and communicated consistently by audience addressed and over time (Table 7). Russia's main enabling factors lie within the resource-geographic dimension. In a resource-endowed country, the establishment of a renewable energy industry has been judged as a first policy priority in order to catch up with global technological development and thereby avoid technological import dependence in the future. These arguments promote Russian R&D, industrializing this knowledge into RE component factories that in their turn deliver materials to project developers of domestic renewable energy power plants. The main discursive constraints remain the unclear definition of renewables and an underestimation of Russia's geographic renewable energy potential.

Financial factors have received the second most discursive attention, especially from the Ministry of Energy and the Government. The rollout of a renewable energy industry should be facilitated by attracting foreign investments and allowing Russia to export RE components and technologies in order to remain an important energy power in the future. Energy efficiency gains should wield financial advantages through resource-saving RE technologies. However, fierce debate remains on the magnitude of the green menace that may threaten Russia's hydrocarbon exports, along with the timing which is often claimed to

[37] This evaluation underestimates the framing of constraining factors, as only documents that explicitly refer to renewable energy sources have been analyzed. When looking at energy documents in general, traditional energy companies very often emphasize ecological advantages of fossil fuels and nuclear energy, neglecting renewable energy sources and their environmental advantages.

**Table 7**
Credibility of factors ordered by frequencies, and critically evaluated by consistency over actors, audiences, and time.

| Dimension | Factors in order of frequency | Consistently shared amongst actors | Consistent by audience addressed | Consistent over time |
|---|---|---|---|---|
| **Resource-geographic** | Establish a Russian renewable energy industry<br>Improve security of supply<br>Diversify the energy mix<br>Exploit Russia's geographic potential<br>Resource type confusion | Resource-geographic factors are widely shared among actors. Actors agree that a renewable energy sector should be localized.<br>The president and traditional energy companies, however, criticize RE on account of Russia's geographic potential. Moreover, policy actors confusingly frame renewables to include natural gas, hydrogen and nuclear energy in order to explain that REPs are not a top priority. | Predominantly addressed to a domestic audience, as it fits the debate on modernizing Russia's energy sector. No substantial differences with messages abroad have been identified. | Establishing an RE industry, improving security of supply, and diversification of the energy mix have been enabling factors from the outset in 2009. |
| **Financial** | Attract RE investments<br>Cost of RE facilities<br>Energy efficiency<br>Threat of a global RE revolution<br>Social factor<br>Improve energy efficiency<br>Export RE components | The ministry of energy and the government attribute most attention to this dimension. Debates, however, remain on the cost-efficiency of RE technologies. Traditional energy companies tend to discredit RE technologies on the basis of their increased costs, pointing at the social factor that seeks to limit electricity price increases to citizens. | Financial factors have been addressed in domestic debates, however, no inconsistencies with messages conveyed abroad are identified. | Increasing attention over time, especially after the ruble crisis of 2014, when RE projects became more expensive and lending was inhibited.<br>The time frame when the threat of a global energy transition becomes imminent is an ongoing debate. In 2016, RE exports gained prominence in the financial framing of REPs. |
| **Institutional** | Develop support schemes<br>Stimulate international RE cooperation<br>Set RE goals<br>Neopatrimonial networks | Institutional arguments are mostly provided by the government and especially the ministry of energy. These executive bodies are responsible for designing and implementing REPs. Neopatrimonial networks are strengthened, rather than reduced as claimed by official discourse. | Except for international cooperation, most factors are discussed in a domestic setting. | RE ambitions have been downgraded over time in terms of RE goals. International cooperation has shifted from Western to Asian partners after 2014. |
| **Ecological** | Climate change<br>Reduce ecological footprint<br>Reduce water, soil, and air pollution | Ecological arguments are mostly articulated by the profile ministry of ecology (MNRE) and the president. The evaluation of ecological characteristics of RE technologies differs. The further down the political hierarchy, the more positive RE contributions are framed. Renewable energy companies positively highlight environmental advantages, while traditional energy companies tend to be more negative. | Whereas general accounts on reducing Russia's ecological footprint are mainly addressed to a domestic audience, climate change is mainly articulated in front of foreign audiences. | References to REPs in order to combat climate change have been centered around COP15 and COP21. |

have consequences only in the medium term (2040). The cost of renewable energy promotion in the context of relatively low Russian electricity prices, and the scaremongering that REPs might result in electricity price hikes as has been the case in Germany may further constrain policy development.

Institutionally, the argumentation of support schemes requiring localization of production and the development of a network of international cooperation in the field of RE reinforced the credibility of the resource-geographic factors that incentivize the development of a Russian renewable energy sector. Major institutional constraining factors are, however, the practice of extending state control over this emerging renewable energy sector and declining renewable energy targets − in contrast to the exponentially growing RE investments in import-dependent countries as China, Japan the EU and India [2].

Ecological factors are not only mentioned least by Russia's elite, but influential actors such as the president tend to negatively assess renewable energy technologies in solving ecological issues. It has become common practice to highlight the ecological advantages of Russia's traditional energy exports such as natural gas, nuclear energy and even coal resources, further constraining renewable energy development. Discourse on combating climate change using RES is mostly confined to foreign audiences, whereas general contributions of RES in reducing the ecological footprint are oriented at a domestic audience. This informs researchers and foreign policy makers not to be guided by internationally-oriented discourse alone, but to triangulate with domestic messages and actual policy implementation.

In conclusion, rather than mediating ecological challenges and giving room to bottom-up green energy companies, Russia's elite emphasize the establishment of a state-controlled renewable energy industry in order to hedge against the green menace that may challenge Russia's hydrocarbon exports in the medium term. The CDA revealed multiple coinciding discursive frames between traditional energy companies and leading executive politicians that reflect not only their interests in fossil rents, but also the underlying neopatrimonial power structure fundamentally constraining a swift renewable energy transition. Russia's elite hope that slowly advancing REPs will be sufficient to catch up with the technological revolution, and remain a global energy power in the long run.

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## References

[1] D.A. Medvedev, Zasedaniye prezidiuma Soveta po modernizatii ekonomiki i innovatsionnomu razvitiyu Rossii o razvitii innovatsionnykh tekhnologiy s ispol'zovaniyem vozobnovlyayemykh istochnikov energii i syr'ya, Meeting of the Presidium of the Council for Economic Modernization and Innovative Development of Russia on the Development of Innovative Technologies with the Use of Renewable Energy and Fuel Sources, Government of the Russian Federation, 04.02.2014, Belgorod, 2014 http://government.ru/news/10228/ (Last Accessed 07 July 2017).

[2] IEA, World Energy Outlook, International Energy Agency, Paris, 2016.

[3] P.-F. Chang, H. Bruyninckx, Wind Energy in China: From Ad Hoc Projects to Strategic Policy, Renewable Energy Law and Policy (RELP), Berlin, 2011.

[4] EU, DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the Promotion of the Use of Energy from Renewable Sources and Amending and Subsequently Repealing Directives 2001/77/EC and 2003/30/EC, European Parliament, Council of the European Union, Brussels, 2009.

[5] J.N. Valdés Lucas, G. Escribano Francés, E. San Martín González, Energy security and renewable energy deployment in the EU: Liaisons Dangereuses or Virtuous Circle? Renew. Sustain. Energy Rev. 62 (2016) 1032–1046.

[6] P. Capros, L. Mantzos, L. Parousos, N. Tasios, G. Klaassen, T. Van Ierland, Analysis of the EU policy package on climate change and renewables, Energy Policy 39 (2011) 1476.

[7] Government of the Russian Federation, Energy Strategy of Russia for the Period up to 2030, Government Decree No. 1715-r, Russian Government, Moscow, 2009 https://minenergo.gov.ru/node/1026 (Last accessed 27.02.2018).

[8] A. Boute, Russia's New Capacity-based Renewable Energy Support Scheme, IFC, Washington, 2013.

[9] A. Boute, Off-grid renewable energy in remote Arctic areas: an analysis of the Russian Far East, Renew. Sustain. Energy Rev. 59 (2016) 1029–1037.

[10] N. Smeets, Opening up the black box: Russia's energy security concept, in: A.P. Heinrich, Heiko (Eds.), Changing Europe: Export Pipelines from the CIS Region, Ibidem, Germany, 2014, pp. 107–127.

[11] L.A. Henry, L.M. Sundstrom, Russia and the Kyoto Protocol: seeking an alignment of interests and image, Global Environ. Polit. 7 (2007) 47–69.

[12] L.A. Henry, L.M. Sundstrom, Russia's climate policy: international bargaining and domestic modernisation, Eur.-Asia Stud. 64 (2012) 1297–1322.

[13] N. Smeets, Combating or Cultivating Climate Change? Russia's Approach to Renewable Energy as an Opportunity for the EU as a Facilitating Actor, UACES Annual Conference, Cork, 2014 https://www.uaces.org/archive/papers/abstract.php?paper_id=834 (Last accessed 28.02.2018).

[14] P. Aalto, D. Dusseault, M. Kennedy, M. Kivinen, Russia's energy relations in Europe and the Far East: towards a social structurationist approach to energy policy formation, J. Int. Rel. Dev. 17 (2014) 1–29.

[15] N. Fairclough, Analysing Discourse: Textual Analysis for Social Research, reprinted., Routledge, London, 2006.

[16] J. Depledge, Striving for No: Saudi Arabia in the climate change regime, Global Environ. Polit. 8 (2008) 9–35.

[17] B.K. Sovacool, How long will it take? Conceptualizing the temporal dynamics of energy transitions, Energy Res. Soc. Sci. 13 (2016) 202–215.

[18] M. Kozlova, M. Collan, Modeling the effects of the new Russian capacity mechanism on renewable energy investments, Energy Policy 95 (2016) 350–360.

[19] P.S. Lombardi, T. Suslov, N. Voropai, Z.A. Styczynski, Isolated power system in Russia: a chance for renewable energies? Renew. Energy 90 (2016) 532–541.

[20] B. Rennkamp, S. Haunss, K. Wongsa, A. Ortega, E. Casamadrid, Competing coalitions: the politics of renewable energy and fossil fuels in Mexico: South Africa and Thailand, Energy Res. Soc. Sci. 34 (2017) 214–223.

[21] N. Wittmann, OPEC: how to transition from black to green gold, Energy Policy 62 (2013) 959–965.

[22] S.A. Al-Ajlan, A.M. Al-Ibrahim, M. Abdulkhaleq, F. Alghamdi, Developing sustainable energy policies for electrical energy conservation in Saudi Arabia, Energy Policy 34 (2006) 1556–1565.

[23] B.V. Ermolenko, G.V. Ermolenko, Y.A. Fetisova, L.N. Proskuryakova, Wind and solar PV technical potentials: measurement methodology and assessments for Russia, Energy 137 (2017) 1001–1012.

[24] Y. Atalay, F. Biermann, A. Kalfagianni, Adoption of renewable energy technologies in oil-rich countries: explaining policy variation in the Gulf Cooperation Council states, Renew. Energy 85 (2016) 206–214.

[25] N. Tynkkynen, Prospects for ecological modernization in Russia: analysis of the policy environment, Demokratizatsiya 22 (2014) 575.

[26] A. Korppoo, Russia and Compliance Under Kyoto: An Institutional Approach, Sustainable Development Programme SDP BN 04/01, The Royal Institute of International Affairs, Chatham House, United Kingdom, 2004.

[27] J. Barnett, The worst of friends: OPEC and G-77 in the climate regime, Global Environ. Polit. 8 (2008) 1–8.

[28] L.B. Andonova, The climate regime and domestic politics: the case of Russia, Camb. Rev. Int. Aff. 21 (2008) 483–504.

[29] A. Boute, A comparative analysis of the European and Russian support schemes for renewable energy: return on European experience for Russia, J. World Energy Law Bus. 4 (2011) 157–180.

[30] N. Smeets, Similar goals, divergent motives: the enabling and constraining factors of Russia's capacity-based renewable energy support scheme, Energy Policy 101 (2017) 138–149.

[31] E. Vasileva, S. Viljainen, P. Sulamaa, D. Kuleshov, RES support in Russia: impact on capacity and electricity market prices, Renew. Energy 76 (2015) 82.

[32] A.V. Belyi, I. Øverland, New narratives on russian renewable energy policy, Revue de l'Energie (2010) 99–105.

[33] P. Willems, Green Giant Will Be Awaken in the East, Fifth International Conference renewable Energy Development in the Russian Far East, Yakutsk, 2014 http://www.eastrenewable.ru/en/media/news/87/ (Last accessed 27.02.2018).

[34] I. Øverland, H. Kjærnet, Russian Renewable Energy: The Potential for International Cooperation, Ashgate, Farnham, 2009.

[35] N. Tynkkynen, P. Aalto, Environmental sustainability of Russia's energy policies, in: P. Aalto (Ed.), Russia's Energy Policies. National, Interregional and Global Levels, Edward Elgar Publishing, 2012, pp. 92–116.

[36] P. Aalto, David Dusseault, Markku Kivinen, Michael D. Kennedy, How are Russian energy policies formulated? Linking actors and structures of energy policy, in: P. Aalto (Ed.), Russia's Energy Policies: National, Interregional and Global Dimensions, Edward Elgar, Cheltenham, 2012.

[37] P. Kotzian, Arguing and bargaining in international negotiations: on the application of the frame-selection model and its implications, Int. Polit. Sci. Rev. 28 (2007) 79.

[38] B.K. Sovacool, I. Mukherjee, Conceptualizing and measuring energy security: a synthesized approach, Energy 36 (2011) 5343–5355.

[39] QSR International Pty Ltd, Nvivo 10, QSR International Pty Ltd, 2012.

[40] T. Romanova, Russian energy in the EU market: bolstered institutions and their effects, Energy Policy 74 (2014) 44–53.
[41] J. Szarka, Wind power, discourse coalitions and climate change: breaking the stalemate? Eur. Environ. 14 (2004) 317–330.
[42] UN, Paris Agreement, United Nations, Paris, 2015.
[43] Y. Trutnev, Speech at the 15th Session of the COP, Ministry of Natural Resources and Ecology, Copenhagen, 2009 18.12.2009, https://www.mnr.gov.ru/news/detail.php?ID=17280&sphrase_id=1901369 (Last Accessed 27 June 2017).
[44] A. Bedritsky, Speech at the 21st session of the COP, Climate Advisor to the President of Russia, 27.11.2015, Russian presidential administration, Paris, 2015 http://kremlin.ru/events/administration/50794 (Last Accessed 27 June 2017).
[45] MNRE, State Report on the Status and Environmental Protection of the Russian Federation in 2014, Ministry of Natural Resources and Ecology, Moscow, 2015 20.07.2015, https://www.mnr.gov.ru/news/detail.php?ID=141666&sphrase_id=1901369 (Last Accessed 28 June 2017).
[46] V.V. Putin, Federal Law No. 121-FZ of July 20, 2012 'On Amending Certain Legislative Acts of the Russian Federation Regarding Regulation of Activities of Non-Profit Organizations Performing the Functions of a Foreign Agent', (2012).
[47] V. Chuprov, Interview with Vladimir Chuprov, Greenpeace Russia, Moscow, 2014 (04.08.2014).
[48] A. Novak, Russian Investment Forum 2017, Ministry of Energy, Sochi, 2017 27.02.2017, http://minenergo.gov.ru/node/7275 (Last Accessed 27 June 2017).
[49] Russian Government, Government Decree of 28 May 2013 No. 449 'O mechanisme stimulirovaniya ispol'zovaniya vozobnovlyaemykh istochnikov energii na optovom rynke elektricheskoi energii i moshchnosti', Russian Government, 2013.
[50] A. Boute, Renewable energy federalism in Russia: regions as new actors for the promotion of clean energy, J. Environ. Law 25 (2013) 261–291.
[51] D.A. Medvedev, Roadmap to the National Technology Initiative 'EnergyNet', Government of Russia, Gorki, 2016 17.06.2016, http://government.ru/news/24688/#doc961 (Last Accessed 27 June 2017).
[52] A.L. Teksler, Interview to News Agency TASS, Ministry of Energy, Saint-Petersburg, 2016 28.06.2016, http://tass.ru/pmef-2016/article/3408448 (Last Accessed 27 June 2017).
[53] A. Novak, Interview to Television Station NTV, Ministry of Energy, Saint-Petersburg, 2016 17.06.2016, http://minenergo.gov.ru/node/5419 (Last Accessed 27 June 2017).
[54] Ministry of Energy, Main Characteristics of Russia's Electricity Market 2016, Ministry of Energy, Moscow, 2017 https://minenergo.gov.ru/node/532 (Last Accessed 28 June 2017).
[55] A. Dvorkovich, Dorogo-zeleno, AO Kommersant, 2016 Kommersant.ru, Moscow https://www.kommersant.ru/doc/3017235.
[56] P. Wang, The Large Dam Dilemma: An Exploration of the Impacts of Hydro Projects on People and the Environment in China, Springer, Dordrecht, 2013.
[57] D.A. Medvedev, Congratulations to the Employees and Veterans of the Nuclear Industry, (2010) 22.09.2010, Moscow http://kremlin.ru/events/president/news/8987 (Last Accessed 27 June 2017).
[58] V.V. Putin, Valdai Club Meeting, (2006) 09.11.2006, Novo-ogarevo http://kremlin.ru/events/president/transcripts/23789 (Last accessed 27 June 2017).
[59] V.V. Putin, Direct Line with Vladimir Putin, (2013) 25.04.2013, Moscow http://kremlin.ru/events/president/news/17976 (Last Accessed 30. June 2017).
[60] A.D. Khafizov, Experience in Project Development of Solar Generation, Hevel Solar, Yakutsk, 2016 09.06.2016, http://www.eastrenewable.ru/upload/iblock/0af/2.%20%D0%90%D0%B9%D0%B4%D0%B0%D1%80%20%D0%A5%D0%B0%D1%84%D0%B8%D0%B7#xps10##xps11#.pdf (Last Accessed 28 June 2017).
[61] International Finance Corporation, Renewable Energy Policy in Russia: Waking the Green Giant, International Finance Corporation, Washington, 2011.
[62] A. Novak, Priorities of Russian Energy Policies, Ministry of Energy, USA, 2013 http://minenergo.gov.ru/node/3380 (Last Accessed 4 January 2018).
[63] A. Boute, P. Willems, RUSTEC: greening Europe's energy supply by developing Russia's renewable energy potential, Energy Policy 51 (2012) 618–629.
[64] A. Chubais, Presidential Meeting with Anatoliy Chubais, Head of Rosnano, (2009) http://kremlin.ru/events/president/news/4045 (Last Accessed 4 January 2018), Gorki, 12 may.
[65] A. Teksler, Interview with Aleksey Teksler at the Forum Open Innovations in Skolkovo, Ekho Moskvy, Ekho Moskvy, Moscow, 2016 http://echo.msk.ru/programs/beseda/1862914-echo/ (Last Accessed 4 January 2018).
[66] Y.-J. Zhang, Interpreting the dynamic nexus between energy consumption and economic growth: empirical evidence from Russia, Energy Policy 39 (2011) 2265–2272.
[67] D.A. Medvedev, Government Meeting, Russian Government, Moscow, 2013 http://government.ru/meetings/712/stenograms/ (Last Accessed 02 January 2018).
[68] A. Novak, Interview to Radio Station Ekho Moskvy, Ministry of Energy, Moscow, 2016 01.10.2016, http://minenergo.gov.ru/node/6142 (Last Accessed 27 June 2017).
[69] Mordashov, Medvedev Meeting with Business Circles, Russian Government, 2015 Gov.ru, Sochi http://government.ru/news/19908/.
[70] A. Novak, Government Meeting, Russian Government, Moscow, 2013 30.10.2013, http://government.ru/news/7876/ (27 June 2017).
[71] A. Dvorkovich, Renewable Energy Sources Will Lead to Tariff Increases, Ria Novosti, Russian Government, Saint-Petersburg, 2016 17.06.2016, http://ria.ru/economy/20160617/1448891227.html (Last Accessed 27 June 2017).
[72] A. Miller, Press-konferentsiya PAO Gazprom po itogam sobranii aktsionerov, Gazprom Press Conference on the Results of the Shareholders' Meeting, Gazprom, 30.06.2016, Moscow, 2016 https://www.youtube.com/watch?v=3wYQ3P3sVmw (Last Accessed 07 July 2017).
[73] A. Novak, Prognoz nauchno-tekhnologicheskogo razvitiya otrasley toplivno-energeticheskogo kompleksa Rossii na period do 2035 goda, Scientific-technologic Development of Russia's Fuel-energy Complex Forecast Until 2035, Ministry of Energy, Moscow, 2016 01.11.2016, http://minenergo.gov.ru/node/6365 (Last Accessed 27 June 2017).
[74] Ministry of Energy, Project Russian Energy Strategy Until 2035, Ministry of Energy, Moscow, 2014.
[75] I. Sechin, Zasedaniye Komissii po voprosam strategii razvitiya TEK i ekologicheskoi bezopasnosti, Meeting of the Commission for Strategic Development of the Fuel and Energy Sector and Environmental Security, 13.02.2013, Novo-Ogarevo, 2013 http://kremlin.ru/events/president/news/17511 (Last Accessed 27 June 2017), Kremlin.ru.
[76] A. Novak, Zasedaniye Komissii po voprosam strategii razvitiya TEK i ekologicheskoi bezopasnosti, Meeting of the Commission for Strategic Development of the Fuel and Energy Sector and Environmental Security, 04.06.2014, Astrakhan, 2014 http://kremlin.ru/events/councils/by-council/29/45831 (Last Accessed 07 July 2017), Kremlin.ru.
[77] A. Yanovsky, Konferentsiya 'Perspektivy razvitiya uglekhimii v Rossii: nauka, tekhnologii i proizvodstva, Conference Perspectives of Developing Russia's Coal Chemistry: Science, Technologies and Production, Ministry of Energy, Kemerovo, 2016 26.01.2016, http://minenergo.gov.ru/node/3960 (Last Accessed 27 June 2017).
[78] A. Novak, Aleksandr Novak vystupil na XVIII Mezhdunarodnom kongresse po obogashcheniyu uglya, Aleksandr Novak Presented at the XVIII International Congress on Coal Enrichment, Ministry of Energy, 28.06.2016, Saint-Petersburg, 2016 http://minenergo.gov.ru/node/5514 (Last Accessed 27 June 2017).
[79] A. Boute, Promoting renewable energy through capacity markets: an analysis of the Russian support scheme, Energy Policy 46 (2012) 68–77.
[80] Russian Government, O vnesenii izmenenii v nekotorye akty Pravitel'stva RF po voprosam stimulirovaniia ispol'zovaniia vozobnovliaemykh istochnikov energii na roznichnykh rynkakh elektricheskoi energii, Rossyjskaya Gazeta, 2015 (No. 47 of 23 January 2015. RG, Moscow).
[81] Russian Government, Government resolution of 28 May No. 861-r 'O vnesenii izmenenii v Osnovnye napravleniya gosudarstvennoi politiki v sfere povysheniya energeticheskoi effektivnosti elektroenergetiki na osnove ispol'zovaniya vozobnovlyaemykh istochnikov energii na period do 2020 goda, utv. rasporyazheniem Pravitelsva RF ot 8 yanvarya 2009 g. N 1-r, Russian Government, 2013.
[82] A. Novak, Commissioning of the Orsk and Abakansk Solar Power Plants, Russian Government, Gorki, 2015 21.12.2015, http://government.ru/news/21179/ (Last Accessed 27 June 2017).
[83] V.V. Putin, Press Conference on the Results of Russian-Chinese Negotiations, 05.06.2012, Beijing, 2012 http://kremlin.ru/events/president/transcripts/15552 (Last Accessed 27 June 2017), Kremlin.ru.
[84] EU and Russia, EU-Russia Energy Cooperation Until 2050 Roadmap, EU-Russia Energy Dialogue, Brussels, 2013 https://ec.europa.eu/energy/sites/ener/files/documents/2013_03_eu_russia_roadmap_2050_signed.pdf (Last accessed 27.02.2018).
[85] A. Dvorkovich, Working Visit to China, Russian Government, Beijing, 2014 09.04.2014, http://government.ru/news/11643/ (Last Accessed 27 June 2017).
[86] A. Dvorkovich, Meeting with Vice-prime Ministers, Russian government, Gorki, 2014 14.04.2014, http://government.ru/news/11688/ (Last Accessed 27 June 2017).
[87] A.L. Teksler, Interview to ITAR/TASS, Ministry of Energy, Moscow, 2015 22.01.2015, https://minenergo.gov.ru/node/4434 (Last Accessed 27 June 2017).
[88] R. Wüstenhagen, E. Menichetti, Strategic choices for renewable energy investment: conceptual framework and opportunities for further research, Energy Policy 40 (2012).
[89] Russian Government, Government Resolution No. 1-r of 8th January on the Fundamental Areas for State Policy in Raising Energy Efficiency in the Electricity Sector Through the Use of Renewable Energy Sources for the Period to 2020, Russian Government, 2009 (Moscow).
[90] Government of the Russian Federation, Government Resolution on the Approval of the State Program of the Russian Federation, Energy Efficiency and Energy Development, No. 512, Russian Government, 2013 (Moscow).
[91] Government Decree No. 321 of 15 April on the Approval of the State Programme on Energy Efficiency and Energy Development, Russian Government, 2014 (15 April, Moscow).
[92] A. Novak, Results of the Ministry of Energy in 2014, Ministry of Energy, Moscow, 2015 15.04.2015, https://minenergo.gov.ru/node/92 (Last Accessed 27 June 2017).
[93] Skhema i programma razvitiya Edinoy Energeticheskoy sistemy Rossii na 2016–2022 gody, in: M.o. Energy (Ed.), Prikaz Minenergo Rossii 1 March 2016 No 147, Ministry of Energy, Moscow), 2016, p. 299.
[94] Government Resolution of 28 July No. 1472-r 'izmeneniya, kotorye vnosyatsya v akty Pravitel'stva Rossiiskoi Federatsii, Russian Government, Moscow), 2015.
[95] V.V. Putin, On Our Economic Tasks, Vedemosti, Kremlin, Moscow, 2012 30.01.2012, http://www.vedomosti.ru/politics/articles/2012/01/30/o_nashih_ekonomicheskih_zadachah (Last accessed 27 June 2017).
[96] D.A. Medvedev, Meeting of the Commission on Modernization and Technological Development of Russia's Economy, (2011) 30.03.2011, Moscow http://news.kremlin.ru/transcripts/10777 (Last Accessed 27 June 2017).
[97] A. Dvorkovich, Meeting with Vice-prime Ministers, Russian government, Moscow, 2013 15.04.2013, http://government.ru/news/1358/ (Last Accessed 27 June 2017).
[98] V. Gel'man, The vicious circle of post-Soviet neopatrimonialism in Russia, Post-

Soviet Aff. (2015) 455–473.
[99] Administrator of the Trading System, Tender Results, ATS, Moscow, 2017.
[100] V.V. Putin, Interregional Conference of United Russia Socio-economic Development Strategy of the Far East Until 2020, Russian Government, Khabarovsk, 2010 06.12.2010, http://archive.government.ru/docs/13223/# (Last Accessed 27 June 2017).
[101] S. Proskurina, J. Heinimö, M. Mikkilä, E. Vakkilainen, The wood pellet business in Russia with the role of North-West Rusian regions: present trends and future challenges, Renew. Sustain. Energy Rev. 51 (2015) 730–740.
[102] S. Singh, S. Jain, V. Tiwari, A. Nouni, M. Pandey, J. Goel, Hydrogen: a sustainable fuel for future of the transport sector, Renew. Sustain. Energy Rev. 51 (2015) 623–633.

**Niels Smeets** is a PhD candidate in Political Sciences at KU Leuven, where he serves as a Research and Teaching Fellow at the Leuven International and European Studies (LINES) Institute. He is a member of the Research Group on Russia and Eurasia.